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FANS

Bulletin No. 28

September 1914



MOTOR TURBINE
BELTED

L.J. Wing Mfg. Co.

352-362 West 13th St. New York

THE WING "DISC FAN"

The Wing "Disc Fan" is the original fan of its type. Not only is it the oldest, but it is the most efficient, having proven its superiority by winning competitive tests in every instance. The many thousands of these fans that have been in operation for over twenty years prove our claim of their reliability and efficiency.

Awards

The Wing "Disc Fan" has won the highest award wherever it has been tested in competition with fans of other makes. "Medals of Highest Award" were received from the American Institute for seven consecutive years until such competitive tests were discontinued.

Highest award was also received at the World's Columbian Exposition and from the Massachusetts Mechanics Association, Boston, Mass., and exhibitions at Edinburgh, Scotland; Antwerp, Belgium; Melbourne, Australia.

Construction

The fan has but three parts. The hub, which is of the best gray cast iron, the blades, which are rolled and formed of the finest open hearth sheet steel, varying in thickness according to the size of the fan, and the arms which are made from the finest soft machinery steel, to which the blades are riveted, threaded on one end so as to screw into the hub with a lock nut holding it in position. After the fan is assembled it is balanced and tested.

Blade Adjustment

The fan construction allows the blades to be adjusted to suit the conditions under which the fan is to operate. Each fan is therefore available for use under widely varying conditions, as the flow of air can be reduced or increased and also reversed without changing the direction of rotation.

Guarantee

We GUARANTEE that the Wing "Disc Fan" and "Propeller Type" Fans will move a greater volume of air per unit of power than any other fan on the market, size for size.

Noiseless Operation

At all ordinary speeds the Wing "Disc Fan" is practically noiseless, and when in operation does not obstruct the light.

Capacities with Various Resistances

The table of capacities and horsepowers on page 9 is guaranteed for free air. When a resistance is offered to the air by a system of duct work or by the materials in a drying room, proper allowance must be made for friction. Tests show that when operating against a resistance sufficient to produce a pressure of $\frac{1}{2}$ " water gauge, the fan will deliver 30 to 35% less air than when delivering free air at the same speed. The horsepower, however, required to drive the fan will be less than for open ventilation.

As an example, a 48" Wing "Disc Fan" operating at 500 revolutions per minute and discharging through a duct 20 feet long having the full diameter of the fan, will deliver 41,500 cu. ft. of air per minute and will require 2.9 horsepower. This fan operating at the same speed with sufficient resistance introduced in the duct to produce a static pressure of $\frac{1}{2}$ " water gauge, will deliver 28,500 cu. ft. of air per minute and will take only 2.33 horsepower.

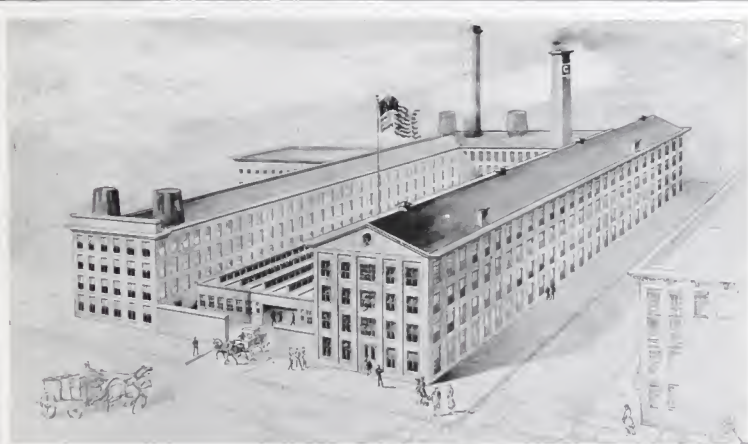
Duct Work

For ordinary ventilation the duct work when properly designed will not offer a greater resistance than $\frac{1}{2}$ " water gauge.

In every case where duct work is connected to the fans it should have at least the same area as the fan. However, if the ducts are very long the area of the duct should be greater than the area of the fan in order that the air shall move at a lower velocity. Thus lower resistance is offered.

Proper Selection of Fans

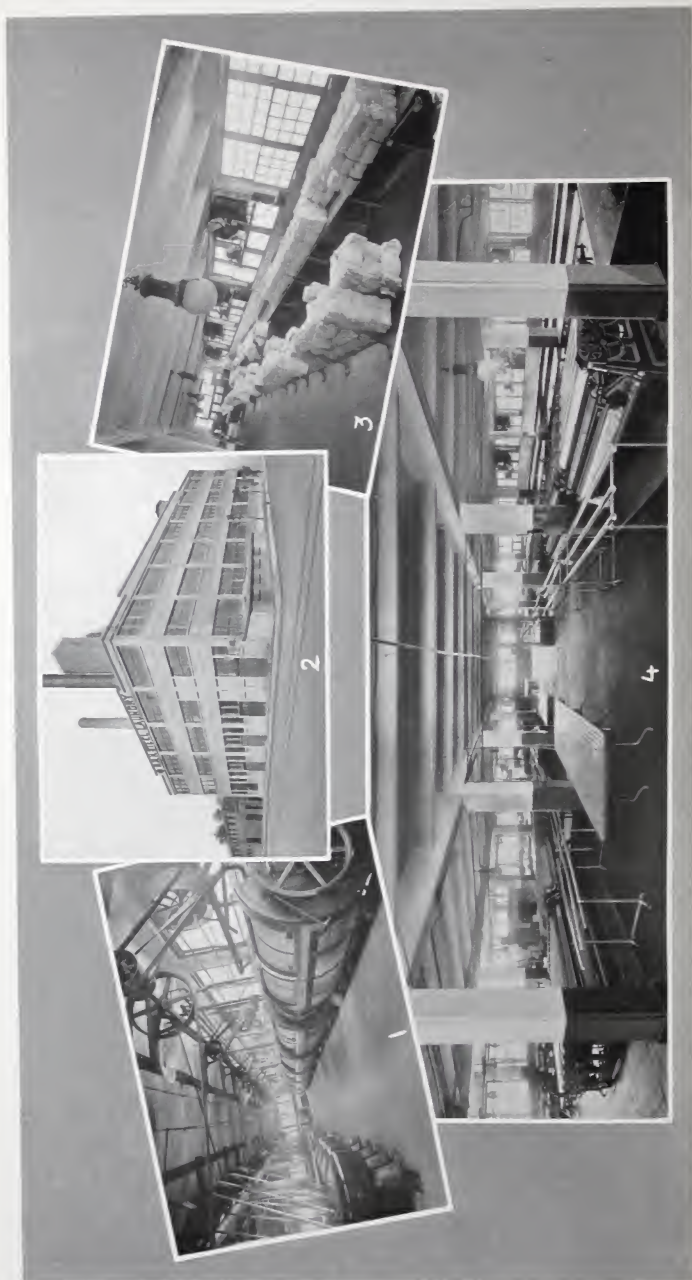
It must be borne in mind when selecting a fan to do certain work that a large fan running slow is much more efficient than a smaller one running fast; for example, assume that it is desired to exhaust 20,000 cubic feet of air per minute, we find by referring to the table on page 9 that a 36" fan will discharge 21,750 cubic feet of air per minute at 600 revolutions per minute, requiring 1.60 horsepower, while a 42" fan will discharge 22,750 cubic feet of air per minute at 400 revolutions per minute, requiring 1.60 horsepower, or a 48" fan 20,750 cubic feet per minute at 250 revolutions per minute requiring only .50 horsepower.



1. *JOS. CHADWICK & SONS (Newburgh Bleachery), Newburgh, N. Y.* This concern has used WING "DISC FANS" for many years. Each addition to the plant resulted in a repeat order for our fans.

2. *ALFRED CREW (Silk Finishers and Dyers), Paterson, N. J.* This plant has been ventilated for over 20 years with WING "DISC FANS," and the numerous repeat orders received prove that they are making good.

3. *BEATTIE MANUFACTURING CO. (Carpets and Rugs), Little Falls, N. J.* Although they have used WING "DISC FANS" only a few years, they have placed several additional orders during that time. Repeat orders mean satisfaction.



The above are views of the R. H. H. STEEL LAUNDRY, Jersey City, N. J. The interior views show 12 WING "DISC FANS" in service, which represent only part of their equipment of WING "DISC FANS."

Why Ventilation Pays

It is a well-known fact that employees can accomplish more work in a room well ventilated than in one which is not. The installation of a ventilating fan or system is not an expense but a well paying investment due to the increased quantity and quality of the work performed.

Removing Vapor

In dyehouses, soaping rooms and the like, the air is so moisture-laden that in cold weather a *heavy fog* is produced and the vapor which condenses on the ceiling drops on the materials being worked, *often spoiling them*. Such a condition not only prevents the employees from doing their work properly but is also injurious to their health. The introduction of a system, similar to that illustrated on page 13, will provide fresh air, clear the atmosphere and stop the dripping.

Drying of Materials

Materials such as leather, paper hangings, tobacco, etc., are improved by the fan system of drying as they come out of the drying room in a much softer condition, therefore with less loss from cracking and shrinkage.

BASIS OF CALCULATION.

Air Required for Ventilation

It is generally assumed that the proper quantity of free air to be introduced into a room in order to obtain the accepted standard of purity is as follows:—

For offices and workshops where the work is light, 2000 cu. ft. of air per hour per person.

In public halls, theatres and the like, 1,500 cu. ft. of air per hour per person.

In factories where the work is heavy 3,000 cu. ft. of air per hour per person.

The above figures are quoted from recognized authorities.

Cooling with Fans

While the above figures are accepted as sufficient for proper ventilation, in summer months, when it is desired to cool as well as ventilate, more air must be exhausted.

Where the source of heat is only from the persons at work, a change of air every 4 to 5 minutes is necessary.

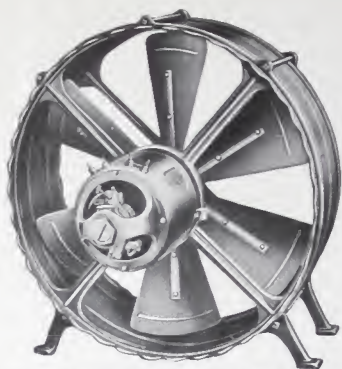
In factories, laundries, engine rooms, etc., in which there are sources of heat other than the employees, a change of air every 2 to 3 minutes should be figured, and in extreme cases as often as one change per minute.

The inside temperature can seldom be kept lower than 5° to 10° Fahrenheit above the outside temperature (in the shade). However, the air kept in rapid circulation through being exhausted, will feel cooler to the body than the thermometer would indicate, due to the evaporation which is set up by moving air coming in contact with the body. For example: Air in motion at 90° Fahrenheit of 75% humidity will feel considerably cooler than still air at 80° and the same percentage of humidity.

Location of Fans

It must be remembered that the foul air must be exhausted and the fresh air admitted at the proper places, so that the ventilation of the entire room will be effective.

If there are several machines in the room to be ventilated which emit smoke, heat, vapor or fumes in large quantities, hoods should be constructed over the same with ducts connecting with the fan.



TYPE "A" MOTOR DRIVEN FAN



TYPE "B" MOTOR DRIVEN FAN

PRICE LIST—DIRECT CURRENT

Diam. of Fan	Type "A"	Type "B"	Extra for Reg. Rheo. Net	Approx. Speed	Weight Approx.	Code Word
18"	\$85.00	\$76.50	\$3.00	1000	83	Mash
24"	110.00	95.00	3.00	800	119	Mast
30"	130.00	110.00	3.00	500	175	March
30"	140.00	120.00	3.00	550	180	Mat
36"	150.00	130.00	4.00	500	250	Man
36"	165.00	145.00	4.00	550	280	Milk
42"	195.00	185.00	7.50	400	370	Miss
42"	235.00	215.00	7.50	450	391	Mock
48"	260.00	.....	10.00	400	540	Mob
48"	305.00	.....	10.00	450	560	Moist
54"	330.00	.....	10.00	400	600	Moon
60"	380.00	.....	10.00	350	660	Moor
60"	420.00	.....	12.00	400	810	Move

The above prices include starting rheostats—if regulating rheostats are desired add extra net prices given in column.

Fans can be furnished to run with shafts in a vertical position blowing upward with motor below. If so desired add 10% to the above prices and in using code add the word "vertical."

Code: If type "A" fans are required prefix the letter A to code word; if type "B" prefix the letter B. If motors are desired wound for 115 volts add "ed" to end of code word; if 220 volts add "ing" if 500, add "as."

PRICE LIST—ALTERNATING CURRENT

60 Cycle, 110 and 220 Volts

Two and Three Phase

Single Phase

Diam. of Fan	Type "A"	Type "B"	Approx. Speed	Code Word	Diam. of Fan	Type "A"	Type "B"	Approx. Speed	Code Word
18"	\$82.00	\$76.50	1140	Bird	18"	\$113.50	\$110.00	900	Sod
24"	100.00	94.50	690	Blast	24"	133.00	127.00	600	Soon
30"	145.00	129.00	575	Black	30"	163.00	156.50	600	Simple
36"	165.00	150.00	575	Boat	36"	214.00	207.00	600	Swan
42"	200.00	188.00	490	Boil	42"	235.00	228.00	450	Sew
48"	275.00	.....	420	Bond	48"	315.00	.....	450	Sun
54"	390.00	.....	380	Boom	...	.....	.....	...	.....
60"	475.00	.....	340	Book	...	.....	.....	...	.....

For 440 and 500 volts, above prices apply on 42" to 60"; for 18" to 36" add 10%.

The above can be furnished to run with shafts in a vertical position blowing upwards with the motor below. If so desired add 10% to the above prices and in using code add word "vertical."

Code: If type "A" fans are required prefix the letter A to code word; if type "B" prefix the letter B.

If motors are desired wound for 110 volts, add "ed" to the end of code word; if 220 volts, add "ing"; if 440 volts, add "es"; if 500 volts, add "on."



TYPE "A" BELT DRIVEN FAN



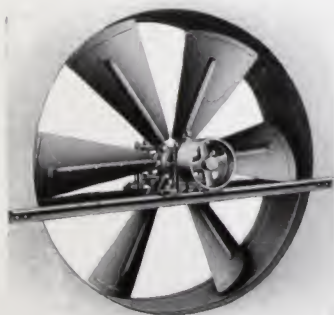
TYPE "B" BELT DRIVEN FAN

PRICE LIST—BELT DRIVEN FANS

Diam. of Fan	Type "A"	Type "B"	Pulley Diam. Face	Usual Speed	Approx. wt. in Lbs.	Telegraph Code
12"	\$15.00	.....	2 x 1 1/4"	1000 to 1200	23	Batter
18"	20.00	\$19.00	3 x 1 1/2"	800 to 1000	29	Battle
24"	25.00	23.00	4 x 2"	600 to 800	55	Bay
30"	32.50	30.00	5 x 3"	500 to 700	81	Bead
36"	38.00	36.00	6 x 3"	500 to 700	120	Beak
42"	47.50	45.00	7 x 4"	400 to 600	150	Bean
48"	57.50	.....	8 x 4"	300 to 600	180	Bear
54"	72.50	.....	9 x 5"	300 to 500	220	Beast
60"	90.00	.....	10 x 6"	200 to 500	280	Bell

NOTE. Belt Fans are always set to rotate to the right (or clockwise) when facing the pulley and exhaust the air from the pulley end, unless otherwise ordered.

SKELETON FANS



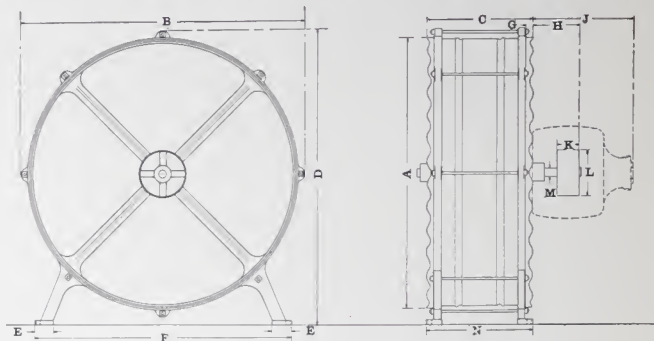
In sizes above 60" cast iron frames are not furnished, only the set of blades, bearings, bearing supports, shaft, collars, pulley and sheet steel band as shown above for erecting in wall or any other convenient place. Termed Skeleton Fan.

Diam.	Price	Pulley		Diam. Shaft	Width of Band	Code Word
		Diam.	Face			
72"	\$100.00	12"	6"	2"	20"	Cold
84"	125.00	14"	7"	2 1/8"	24"	Hot
96"	150.00	16"	7"	2 1/8"	28"	Air
108"	200.00	18"	8"	2 1/8"	28"	Pure
120"	250.00	20"	8"	3 1/8"	32"	Neat
132"	300.00	22"	9"	3 7/8"	32"	Faith
144"	350.00	24"	10"	4 1/8"	36"	True

The above fans are always furnished with pulleys unless otherwise ordered. They may have Electric Motors or Steam Engines coupled direct to shaft on which prices can be given on application. Separate bases must be furnished for motors or engines.

These fans are always shipped in the "knockdown" with proper gauges and instructions for assembling.

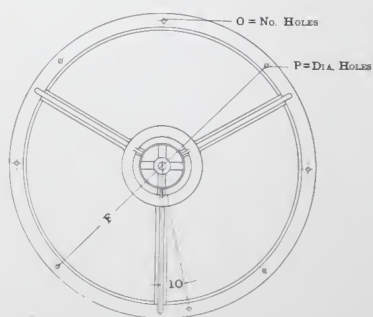
DIMENSION TABLES



TYPE "A" FAN

SIZE—A	B	C	D	E	F	G	H	J*	K	L	M	N
12"	12 $\frac{3}{8}$ "	8"	13"	1 $\frac{3}{4}$ "	13 $\frac{1}{4}$ "	3 $\frac{3}{4}$ "	2"	...	1 $\frac{1}{4}$ "	2"	1 $\frac{1}{2}$ "	7"
18"	18 $\frac{3}{8}$ "	10"	19"	2 $\frac{1}{4}$ "	15 $\frac{3}{4}$ "	3 $\frac{3}{4}$ "	3"	10"	1 $\frac{1}{2}$ "	3"	3 $\frac{3}{4}$ "	9 $\frac{1}{2}$ "
24"	24 $\frac{1}{2}$ "	12"	25"	2 $\frac{3}{4}$ "	22 $\frac{1}{4}$ "	3 $\frac{3}{4}$ "	3 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "	2"	4"	1"	12"
30"	30 $\frac{3}{4}$ "	13"	33"	2 $\frac{3}{4}$ "	28 $\frac{1}{4}$ "	3 $\frac{3}{4}$ "	6"	12 $\frac{1}{2}$ "	3"	5"	1"	12 $\frac{1}{2}$ "
36"	37"	14"	38"	2 $\frac{1}{2}$ "	34"	1"	6"	13 $\frac{3}{4}$ "	3"	6"	1 $\frac{3}{8}$ "	13 $\frac{1}{2}$ "
42"	45 $\frac{1}{2}$ "	15"	45 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "	36 $\frac{3}{4}$ "	1"	8"	16"	4"	7"	1 $\frac{3}{16}$ "	14"
48"	51 $\frac{1}{2}$ "	16"	52 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	44 $\frac{1}{4}$ "	1"	8"	17 $\frac{1}{2}$ "	4"	8"	1 $\frac{3}{16}$ "	15"
54"	56 $\frac{1}{2}$ "	17"	56"	3 $\frac{1}{2}$ "	48 $\frac{1}{2}$ "	1 $\frac{1}{4}$ "	9"	20"	5"	9"	1 $\frac{3}{8}$ "	16"
60"	63 $\frac{1}{2}$ "	18"	63 $\frac{1}{4}$ "	3"	55"	1 $\frac{1}{4}$ "	10"	23"	6"	10"	1 $\frac{1}{2}$ "	17"

*Dimension J is approximate.



TYPE "B" FAN

SIZE	A	B	C	F	H	J*	K	L	M	O	P
18"	18 $\frac{3}{4}$ "	21 $\frac{1}{4}$ "	6 $\frac{3}{4}$ "	19 $\frac{7}{8}$ "	4 $\frac{3}{4}$ "	10"	1 $\frac{1}{2}$ "	3"	3 $\frac{3}{4}$ "	4	1 $\frac{5}{16}$ "
24"	24 $\frac{1}{8}$ "	27 $\frac{1}{8}$ "	8 $\frac{1}{8}$ "	26 $\frac{7}{8}$ "	6 $\frac{5}{16}$ "	11 $\frac{1}{2}$ "	2"	4"	1"	4	1 $\frac{9}{16}$ "
30"	31 $\frac{1}{8}$ "	35 $\frac{1}{8}$ "	9 $\frac{1}{8}$ "	33 $\frac{1}{8}$ "	7 $\frac{5}{16}$ "	12 $\frac{1}{2}$ "	3"	5"	1"	4	1 $\frac{9}{16}$ "
36"	37 $\frac{1}{8}$ "	41 $\frac{1}{2}$ "	10 $\frac{1}{8}$ "	39 $\frac{1}{4}$ "	7 $\frac{5}{16}$ "	13 $\frac{3}{4}$ "	3"	6"	1 $\frac{3}{16}$ "	8	1 $\frac{9}{16}$ "
42"	43"	47 $\frac{1}{4}$ "	11 $\frac{1}{2}$ "	45 $\frac{3}{4}$ "	8 $\frac{5}{16}$ "	16"	4"	7"	1 $\frac{3}{16}$ "	8	1 $\frac{9}{16}$ "

*Dimension J is approximate.

CAPACITY AND POWER TABLE OF WING "DISC FANS"

Amount of air discharged in cubic feet, and power required.

This table is based on open ventilation

Blade Angle of Fan 30°.

Size of Fan	Speed in Revolutions Per Minute.										
	150	200	250	300	350	400	450	500	600	700	800
18"	Vol. H.P.							1,860 .070	2,240 .09	2,600 .14	2,980 .200
24"	Vol. H.P.					4,000 .10	4,500 .12	5,000 .155	6,000 .22	7,000 .30	8,000 .48
30"	Vol. H.P.					6,000 .13	8,050 .24	10,000 .44	12,100 .70	13,950 1.00	15,960 1.32
36"	Vol. H.P.					10,800 .31	14,500 .55	18,200 0.97	21,750 1.60	25,400 2.40	29,000 3.31
42"	Vol. H.P.					17,000 .425	22,750 1.00	28,500 1.80	34,260 3.00	39,960 4.55	45,700 6.07
48"	Vol. H.P.					24,750 .81	33,200 1.71	41,500 2.90	49,750 4.80	58,200 6.65	66,500 8.65
54"	Vol. H.P.					34,500 1.22	46,250 2.61	52,000 3.60	69,500 5.10	81,000 7.40	92,500 10.00
60"	Vol. H.P.					47,000 1.80	63,000 3.85	78,500 9.00	94,500 16.70	110,000 24.00	126,000 32.750

Data on larger fans sent upon request.

WING "PROPELLER TYPE" FANS

Realizing the demand for a fan of small dimensions capable of exhausting or forcing a very large volume of air through an opening or system of duct work very much limited in size—we are offering to the public the Wing "Propeller Type" Fan, a fan which is in every way equal to these requirements, being the result of years of experimenting, with efficiency and quietness the prime consideration.



The Wing "Propeller Type" Fan is the fan used so successfully in connection with the new Wing "Type E" Blower and the "Typhoon" Turbine Blower, which under severe conditions of service are required to work against resistances equivalent to 2-inches and even 5-inches water gauge pressure—something heretofore unheard of with

an open type fan.

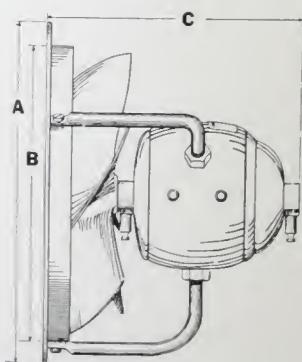
The above is sufficient proof that the Wing "Propeller Type" Fan may be used under conditions usually requiring the centrifugal fan or blower as well as for open ventilation.

AIR DELIVERY AND PRICES

Size Diam.	Speed	Approx. Free Air Delivery	HP Motor Enclosed	PRICES D. C. and A. C.	
				110 V	220 V
10"	1750	900	$\frac{1}{2}$	\$36.00	\$37.90
13"	1500	2000	$\frac{1}{6}$	59.70	61.50
17"	1200	3300	$\frac{1}{4}$	84.20	86.20
22"	1200	3700	$\frac{1}{4}$	86.80	89.00
†22"	1475	4600	$\frac{3}{4}$	98.90	100.00

† Not made in A. C.; D. C. only.

Please bear in mind that we have a well equipped service department which is always pleased to help you solve your ventilation problems and help you select the proper size and type fan for your purpose. Tell us the size and nature of the room you have to ventilate and we will supply you with complete data—gratis.



DIMENSIONS

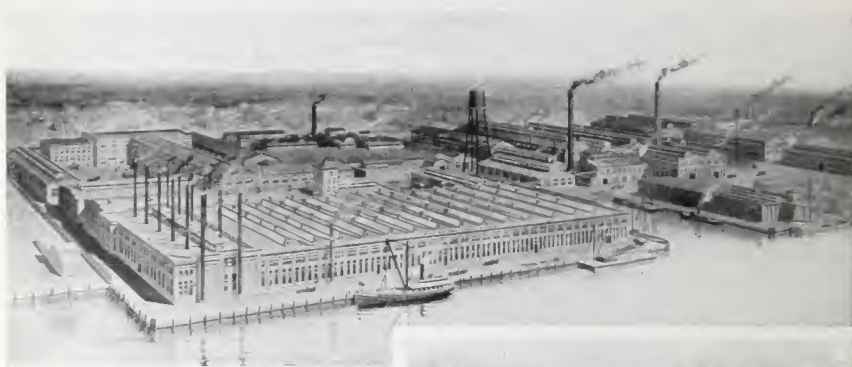
Size	A	B	C
10"	12 $\frac{1}{2}$ "	10"	9"
13"	16"	13 $\frac{1}{2}$ "	13"
17"	20"	17"	17"
22"	25"	22"	18"



1. **JOSEPH BANCROFT & SONS CO.,** Wilmington, Del., Manufacturers, Bleachers, Dyers and Finishers. This company is one of the original users of WING "DISC FANS." Since the time they first installed our fans they have tried fans of other makes only to return to the WING "DISC FAN" more convinced than ever as to its reliability.

2. **RUNKEL BROS.,** New York City, Chocolate and Cocoa Manufacturers. The first installation of WING "DISC FANS" demonstrated that good ventilation was profitable and resulted in their making numerous additional installations.

3. **HENRY HEIDE,** New York City, one of the largest manufacturers of confectionery in the world. Thirty WING "DISC FANS" keep the air constantly fresh and pure in this factory and permit the employees to produce better work.



1. NATIONAL CONDUIT & CABLE
COMPANY

Hastings-on-Hudson, N. Y.

2. KEENE GLUE WORKS

Keene, N. H.

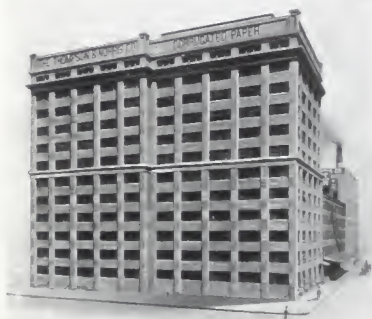


3. THOMPSON & NORRIS

Brooklyn, N. Y.

4. FORD MOTOR CO.

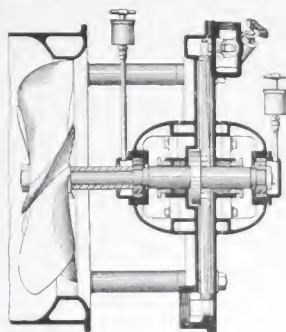
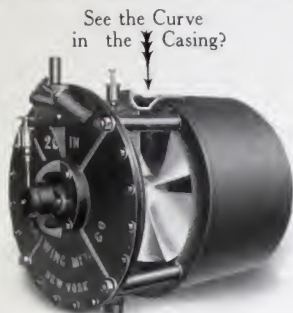
Long Island City.



The above plants protect the health of their employees by supplying them with the proper amount of fresh air by the use of WING "DISC FANS."

"TYPE E" STEAM TURBINE DRIVEN FANS

In our past experience we have often found a great want for a steam turbine driven ventilating fan. We have experimented for a number of years—finally producing a fan which will meet nearly all requirements. The "Type E" steam turbine driven fan is the result of long experience and experiments.



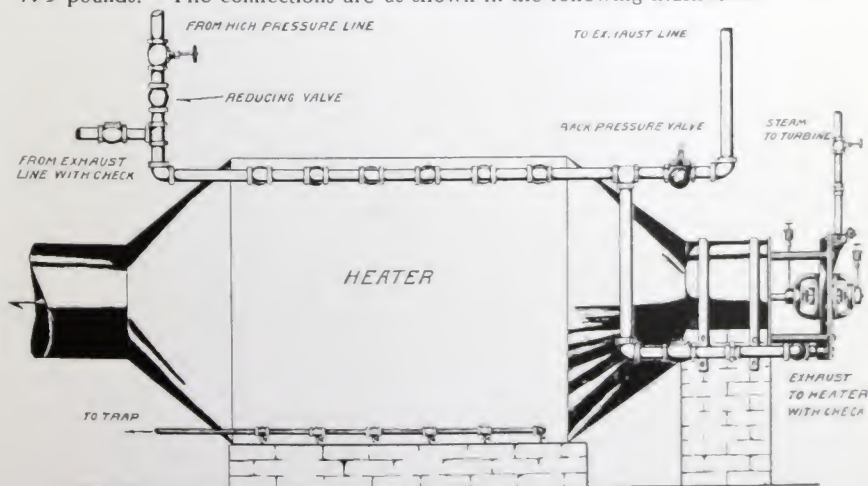
CONSTRUCTION

Its construction is extremely rugged. The propeller type fan is of cast aluminum and direct connected to the turbine, the rotor of which is of solid bronze. The turbine has stuffing boxes which permit of high back pressure.

The usual use for this type of fan is in connection with a stack of heating coils so that the exhaust steam of the turbine enters the coils and the air from the fan blowing through the stack is heated to whatever temperature is required. This fan is capable of delivering air long distances with duct work, as a pressure of 2 inches static can be readily maintained. It is high in speed, therefore delivering a great volume of air and occupying little space. Where it is to be used for heating the air, it may be found on account of its high economy that outside exhaust steam must be used in connection with the exhaust of the turbine in order to obtain the required temperature.

This unit is well adapted for exhaust ventilation, particularly in locations where fans driven by belting or electric motors cannot be used.

It is designed to run with steam pressures anywhere from 30 pounds up to 175 pounds. The connections are as shown in the following illustration.



Interesting Adaptations

The accompanying illustrations show two installations of WING "DISC FANS" made on the roof of the Horton Ice Cream Co. of New York.

The lower photo shows a 54-inch WING "DISC FAN" exhausting air from the gas producer room in the basement, seven floors below. *"It can't be done with a disc fan,"* said our competitors, but if you will notice in the picture it



was necessary to build a deflector to stop the hot air from blowing into the cooling tower fan 30 feet away — so powerful is the discharge.

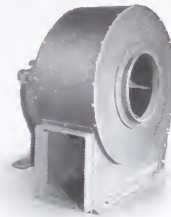
The cooling tower shown above was first equipped with fans of a different make, but after they had seen the re-

markable results from the other installation, WING "DISC FANS" were quickly installed which resulted in a very noticeable increase in the efficiency and capacity of the tower

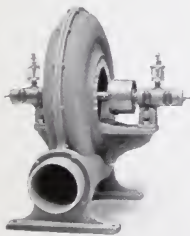
STEEL PLATE AND CAST IRON BLOWERS AND EXHAUSTERS.



1



2



3



4

Fans Nos. 1 and 4 are used principally for ventilation where the air must be handled at higher pressures than come within the scope of the Wing "Disc Fans" such as through very long ducts of small area necessitating high velocities.

Fan No. 2 is also used for ventilating work, induced draft for boilers, exhausting shavings and dust and for conveying materials. These fans, in the small sizes, are made with cast iron housings.

Fan No. 3 handles air at high pressures up to 12-ounces for cupolas, blacksmith fires, furnaces, etc.

For further information ask for special blower catalog.

A Few Users

A few firms in almost every line of business who are actually operating Wing "Disc Fans," electric, steam or belt driven.

Wing "Disc Fans" have received highest awards wherever exhibited, such as:—

The World's Columbian Exposition.

American Institute—for seven years until discontinued.

Massachusetts Mechanics' Association

Edinburgh, Scotland.

Antwerp, Belgium.

Melbourne, Australia.

UNITED STATES GOVERNMENT

U. S. Capitol..... Washington, D. C.
U. S. Dept. Com. & Labor..... Washington, D. C.
U. S. Dept. Interior..... Washington, D. C.
U. S. Post Office..... Washington, D. C.
U. S. Govt. Ptg. Office..... Washington, D. C.
U. S. Treasury..... Washington, D. C.
*U. S. Naval Academy..... Annapolis, Md.

BAKERS

C. E. Abbott..... N. Y. City
W. E. Cushman..... N. Y. City
National Biscuit Co..... N. Y. City
H. H. Kohnstaat & Co..... Chicago, Ill.
J. H. Shultz..... Brooklyn, N. Y.

BANKS AND BANKERS

J. S. Bache & Co..... N. Y. City
Chatham & Phoenix Nat. Bank..... N. Y. City
Farmers' Loan & Trust Co..... N. Y. City
Irving National Bank..... N. Y. City
Market & Fulton Nat'l Bank..... N. Y. City
Windsor Trust Co..... N. Y. City
First National Bank..... Chicago, Ill.
German National Bank..... Pittsburgh, Pa.
Union County Trust Co..... Elizabeth, N. J.

BLEACHERIES

Danvers Bleachery..... Peabody, Mass.
Fall River Bleachery Co..... Fall River, Mass.
*Joseph Chadwick & Son..... Newburgh, N. Y.
Lawrence Dye Works Co..... Lawrence, Mass.
Lowell Bleachery..... Lowell, Mass.
Middlesex Bldg. Dye & Pt. Wks.,..... Somerville, Mass.
Millville Mfg. Co..... Millville, N. H.

BREWERS AND MALTSTERS

Bernheimer & Schwartz Brew. Co..... N. Y. City
George Ehret..... N. Y. City
Lion Brewery..... N. Y. City
Decatur Brewing Co..... Decatur, Ill.
Hudson Co. Con. Brew. Co..... Jersey City, N. J.
Welz & Zerweck Brew. Co..... Brooklyn, N. Y.
Hanley Brewing Co..... Providence, R. I.

BRICK MANUFACTURERS

Amer. En'm'd Brick & Tile Co. Sth. River, N. J.
Perth Amboy Ter. Cot. Co. Perth Amboy, N. J.
Pullman Brick Co..... Pullman, Ill.
M. D. Valentine & Bros. Co. Woodbridge, N. J.

BUILDINGS (OFFICE)

Astor Court Building..... N. Y. City
Beaver Building..... N. Y. City
Hayes Building..... N. Y. City
Metropolitan Life Ins. Building..... N. Y. City
Nemo Building..... N. Y. City
Plimpton Building..... N. Y. City
Simon Zinn Building..... N. Y. City
Standard Oil Co. Building..... N. Y. City
Woodbridge Building..... N. Y. City
Garfield Real Estate Co..... Rochester, N. Y.

BUILDINGS (PUBLIC)

New York Clearing House..... N. Y. City
Essex County Court House..... Newark, N. J.
Richmond Co. Jail..... Staten Island, N. Y.
Troop C Armory..... Brooklyn, N. Y.

CARPET CLEANING

*Paul L. Bryant..... N. Y. City
National Carpet Cleaning Co..... N. Y. City
New York Carpet Cleaning Co..... N. Y. City

CARPET MANUFACTURERS

*Beattie Mfg. Co..... Little Falls, N. Y.
Hartford Carpet Co..... Thompsonville, Conn.
*McCleary, Wallin & Crouse. Amsterdam, N. Y.
Read Carpet Co..... Bridgeport, Conn.
Alex. Smith & Co..... Yonkers, N. Y.

CHEMICALS, DRUGS, ETC.

Hegeman & Co..... N. Y. City
McKesson & Robbins..... N. Y. City
Rogers & Pyatt..... N. Y. City
Adler Color & Chem. Works..... Brooklyn, N. Y.
*Battelle & Renwick..... Jersey City, N. J.
Harrison Bros..... Philadelphia, Pa.
Internat. Ultramarine Works..... Rossville, N. Y.
Mutual Chemical Co..... Jersey City, N. J.
*Warner Chemical Co..... Carteret, N. J.

CLUBS AND SOCIETIES

Aldine Club..... N. Y. City
Crescent Athletic Club..... N. Y. City
Merchants' Club..... N. Y. City
New York Athletic Club..... N. Y. City
N. Y. Bridge Whist Club..... N. Y. City
Reform Club..... N. Y. City
Union League Club..... N. Y. City
Union League Club..... Chicago, Ill.

COLD STORAGE AND REFRIGERATING

Central Texas Ice Co..... Mexia, Texas
*Merchants' Refrig. & Ice Mfg. Co. N. Y. City

*Indicates from 6 to 30 fans.

A Few Users

CONFECTIONERS

Knickerbocker Chocolate Co.....N. Y. City
 *Darrow & Ruddin.....N. Y. City
 Hawley & Hoops.....N. Y. City
 *Henry Heide.....N. Y. City
 J. M. Horton Ice Cream Co.....N. Y. City
 Huyler's (Inc.).....N. Y. City
 *Alexander M. Powell.....N. Y. City
 *Runkel Bros.N. Y. City
 Croft & Allen Co.....Philadelphia, Pa.
 Rockwood & Co.....Brooklyn, N. Y.
 *Stern & Saalsberg.....N. Y. City
 Zion Sugar & Conf. Ass'n.....Zion City, Ill.

CORDAGE AND TWINES

*Columbia Rope Co.....Auburn, N. Y.
 National Cordage Co.....N. Y. City
 *Travers Bros.....N. Y. City
 Wall Rope Works.....N. Y. City

COTTON GOODS

Eureka Hose Co.....N. Y. City
 American Linen Co.....Fall River, Mass.
 *Joseph Bancroft & Sons....Wilmington, Del.
 Fulton Bag & Cotton Mills.....Atlanta, Ga.
 *Mount Vernon Co.....Baltimore, Md.
 *Pacific Mills (54 fans).....Lawrence, Mass.
 *Shenandoah Cotton Mills.....Utica, N. Y.

DRY GOODS AND DEPARTMENT STORES

S. S. Kressge.....Brooklyn, N. Y.
 Bloomingdale Bros.....N. Y. City
 Catlin & Co.....N. Y. City
 *J. B. Greenhut Co.....N. Y. City
 Jas. McCreery & Co.....N. Y. City
 O'Neill, Adams Co.....N. Y. City
 Charles Broadway Rouss.....N. Y. City
 Ely & Walker Dry Goods Co...St. Louis, Mo.
 Sibley, Lindsay & Curr.....Rochester, N. Y.
 Strawbridge & Clothier.....Philadelphia, Pa.
 Marshall Field & Co.....Chicago, Ill.
 Zion Co-op. Mer'tile Inst. Salt Lake City, Utah
 Duffy Powers Co.....Rochester, N. Y.

DYERS AND FINISHERS

*J. E. Reynolds & Co.....N. Y. City
 Davis & Quick.....Brooklyn, N. Y.
 Barrett, Nephews & Co...Staten Island, N. Y.
 Liberty Dye Works.....Reading, Pa.
 Firth & Foster Bros.....Philadelphia, Pa.
 Patten Dye Works.....Hartford, Conn.
 Standard Silk Dyeing Co.....Paterson, N. J.
 Ohio Falls Dye & Finishing Co. Louisville, Ky.
 Henry W. Boettger Co.....N. Y. City
 *Alfred Crew.....Paterson, N. J.
 *Weidmann Silk Dyeing Co...Paterson, N. J.
 *U. S. Fin. Co.....Passaic, N. J.
 *Perfect Silk Finishing Co.....Easton, Pa.

GLUE MANUFACTURERS

Baeder, Adamson & Co.....Boston, Mass.
 Keene Glue Works.....Keene, N. H.
 Peter Cooper Co.....Brooklyn, N. Y.

HAT MANUFACTURERS

Waring Hat Co.....Yonkers, N. Y.
 Rough Hat Co.....So. Norwalk, Conn.
 *Crofut & Knapp Co.....So. Norwalk, Conn.
 Hoyt, Wolthausen & Co.....Danbury, Conn.
 *J. G. Mohn & Bros.....Reading, Pa.
 Mohawk Val. Scotch Cap Fact'y. Utica, N. Y.
 Napier Mitchell Mfg. Co.....Belleville, N. J.
 John B. Stetson Co.....Philadelphia, Pa.
 J. C. Wilson & Co.....So. Norwalk, Conn.
 Trimble Hat Co.....Orange, N. J.

HOSPITALS

Bellevue Hospital.....N. Y. City
 Essex Co. Hos. for Insane...Overbrook, N. J.
 German Hospital.....Jersey City, N. J.
 German Hospital.....Brooklyn, N. Y.
 Northern Illinois Hospital.....Elgin, Ill.
 Moses Taylor Hospital.....Scranton, Pa.
 Rochester City Hospital.....Rochester, N. Y.

HOTELS AND APARTMENTS

Bretton Hall Hotel.....N. Y. City
 Adlon Apartments.....N. Y. City
 Cromwell Apartments.....N. Y. City
 EndicottN. Y. City
 Great Northern Hotel.....N. Y. City
 Langham Hotel.....N. Y. City
 Broadway & Cathedral Parkway Co. N. Y. City
 MajesticN. Y. City
 Madison Square Apartments.....N. Y. City
 Marie Antoinette.....N. Y. City
 Hotel Marseilles.....N. Y. City
 Hotel McAlpin.....N. Y. City
 RoyaltonN. Y. City
 YorkN. Y. City
 Briarcliff Manor.....Briarcliff, N. Y.
 Bingham House.....Philadelphia, Pa.
 Palmer House.....Chicago, Ill.

JEWELERS

Tiffany & Co.....N. Y. City
 Carer, Howe & Co.....Newark, N. J.
 Inter. Watch Case Co.....Jersey City, N. J.
 Krementz & Co.....Newark, N. J.
 Philadelphia Watch Case Co. Riverside, N. J.
 New Eng. Watch Co.....Waterbury, Conn.
 Rogers Silver Plate Co.....Danbury, Conn.

INSURANCE COMPANIES

Germania Fire Insurance Co.....N. Y. City
 Liverpool, Lon. & Globe Ins. Co.....N. Y. City

LAUNDRIES

Broadway Central Laundry.....N. Y. City
 Empire Steam Laundry.....N. Y. City
 Imperial Laundry.....N. Y. City
 Park Laundry.....N. Y. City
 Somerset LaundryN. Y. City
 *Stancourt LaundryN. Y. City
 Wendell & Evans.....N. Y. City
 *Cascade Laundry.....Brooklyn, N. Y.
 City Laundry.....Portland, Oregon
 Excelsior Laundry.....Los Angeles, Cal.
 Kearney St. Laundry Co.....Kearney, Neb.
 Mohawk Laundry.....Amsterdam, N. Y.

*Indicates from 6 to 30 fans

A Few Users

LAUNDRIES—Continued

Marshall's Laundry.....Plainfield, N. J.
Olympian Laundry.....Boston, Mass.
Paris Laundry Co.....Chicago, Ill.
*R. H. H. Steele Laundry Co. Jersey City, N. J.
Modern Laundry.....Phillipsburg, N. J.

METAL GOODS

Carey Mfg. Co.....Brooklyn, N. Y.
Dale Co.....N. Y. City
*H. L. Judd Company.....N. Y. City
Mitchell Vance Co.....N. Y. City
*United Metal Co.....N. Y. City
*Bradley & Hubbard Mfg. Co. Meriden, Conn.
Shapiro & Aaronson.....Brooklyn, N. Y.
S. Sternau & Co.....Brooklyn, N. Y.
A. Schraeder's Sons.....N. Y. City

PACKERS AND BUTCHERS

M. Crane Co.....N. Y. City
N. Y. Butchers' Dressed Beef Co.....N. Y. City
*United Dressed Beef Co.....N. Y. City
Richard Weber.....N. Y. City
Sulzberger Sons & Co.....N. Y. City
Wallabout Market Pkg. Co.....Brooklyn, N. Y.
Armour & Co.....Chicago, Ill.
Evansville Packing Co.....Evansville, Ind.
Swift & Co.....Jersey City, N. J.

PAPER GOODS

Thompson & Norris.....N. Y. City
Robert Gair, Paper Goods.....Brooklyn, N. Y.
American Straw Board Co.....Lockport, Ill.
Byron Weston Co.....Dalton, Mass.
Champion Coated Paper Co.....Hamilton, Ohio
Harvey Paper Co.....Wellsburg, W. Va.
*Jessups & Moore Paper Co. Wilmington, Del.
Mason-Perkins Paper Co.....Bristol, N. H.
Riverside Paper Co.....Holyoke, Mass.
Valley Paper Co.....Holyoke, Mass.

PRINTERS AND PUBLISHERS

American Lithographing Co.....N. Y. City
American News Company.....N. Y. City
Brett Lithographing Co.....N. Y. City
De Vinne Bros.....N. Y. City
Globe & Commercial Advertiser.....N. Y. City
Harper & Bros.....N. Y. City
P. F. Collier & Son.....N. Y. City
Munn & Co.....N. Y. City
Metropolitan Printing Co.....N. Y. City
N. Y. Press.....N. Y. City
Engineering Record.....N. Y. City
N. Y. American.....N. Y. City
New York World.....N. Y. City
New York Sun.....N. Y. City
New York Staats Zeitung.....N. Y. City
Keller Printing Co.....N. Y. City
David Williams Co.....N. Y. City
Winthrop Press.....N. Y. City
Metropolitan Ptg. Co.....Elizabethport, N. J.
Reading Eagle Co.....Reading, Pa.
Rand, McNally & Co.....Chicago, Ill.
New Haven Register.....New Haven, Conn.

PRINT WORKS

American Printing Co.....Fall River, Mass.
*Eddystone Mfg. Co.....Eddystone, Pa.
*Passaic Print Works.....Passaic, N. J.
*Worthen & Aldrich Co.....N. Y. City
*Columbia Print Works.....Montville, N. J.
John Lang Paper Co.....Philadelphia, Pa.

RESIDENCES

J. B. De Lamar.....Glen Cove, L. I.
George J. Gould.....N. Y. City
F. L. Stetson.....N. Y. City
George Eastman.....Rochester, N. Y.

RESTAURANTS

Dennett's.....N. Y. City
Davidson's.....N. Y. City
Cafe de Beaux Arts.....N. Y. City
Exchange Buffet.....N. Y. City
*Holtz & Freystadt.....N. Y. City
White's.....N. Y. City
Dennett's.....Philadelphia, Pa.
Dennett's.....Brooklyn, N. Y.
Hoff-Brau Haus.....N. Y. City
Mouquin's.....N. Y. City
*Murray's.....N. Y. City
Feltman Bros.....Coney Island, N. Y.
Phillip's Lunch.....Brooklyn
T. D. Longley.....New Haven, Conn.
M. F. Shanley.....New Haven, Conn.

RUBBER GOODS

Michelin Tire Co.....Millville, N. J.
Parker, Stearns & Co.....N. Y. City
Boston Rubber Shoe Co.....Malden, Mass.
Goodyear Rubber Co.....Naugatuck, Conn.
*I. B. Kleinert & Co.....College Point, L. I.
N. J. Car Spg. & Rub. Co.....Jersey City, N. J.
N. Y. Belting & Packing Co.....Passaic, N. J.
C. Roberts Rubber Co.....Newark, N. J.
Rubber Goods Co.....New Brunswick, N. J.
Trenton Rubber Co.....Trenton, N. J.
Gutta Percha & Rubber Co.....N. Y. City
India Rubber Co.....New Brunswick, N. J.

SCHOOLS AND COLLEGES

Public School No. 31.....N. Y. City
Public School No. 132.....N. Y. City
School of Our Lady of Good Counsel, N. Y. C.
Public School No. 43.....Bronx, N. Y.
Public School No. 20.....Bronx, N. Y.
Public School No. 165.....Brooklyn, N. Y.
Mechanics' Inst. of Rochester. Rochester, N. Y.
University of Rochester.....Rochester, N. Y.
School.....Baldwin, L. I.
St. Olaf School.....Northfield, Minn.

SILK MANUFACTURERS

E. & H. Levy.....N. Y. City
Smith & Kaufman.....N. Y. City
American Ribbon Fin. Co.....Paterson, N. J.
*Doherty & Wadsworth.....Paterson, N. J.
Oppenheimer & Levy.....Paterson, N. J.
Sweeney & Busier Co.....Paterson, N. J.
Stewart Silk Co.....Easton, Pa.
*J. H. & C. K. Eagle.....Shamokin, Pa.

*Indicates from 6 to 30 fans.

A Few Users

SOAP MANUFACTURERS

Kirkman & Son..... Brooklyn, N. Y.
Fairchild & Shelton..... Bridgeport, Conn.
Marsh Company..... Lynn, Mass.
J. B. Williams Co..... Glastonbury, Conn.
Wrigley Mfg. Co..... Philadelphia, Pa.

STABLES

American Express Co..... N. Y. City
Albert Busch Co..... N. Y. City
Clover Farms Dairy Co..... N. Y. City
Fleischmann & Co.'s Stables..... N. Y. City
Lowden's Stables..... N. Y. City
Marshall Field & Co..... Chicago, Ill.

STEAMSHIP LINES

Atlas S. S. Co..... N. Y. City
Hudson Nav. Co., St. Berkshire..... N. Y. City
Monarch Line S. S. Co..... N. Y. City
*Munson Steamship Line..... N. Y. City
North German Lloyd S. S. Co..... N. Y. City
Quebec S. S. Co..... N. Y. City
Red Cross Line..... N. Y. City

STEAM YACHTS

E. Diener, Morgan So. Australia, Steamer Merl
S. Y. Rechdair.....
S. Y. Christena.....

TANNERS AND CURRIERS

*Fayerweather & Ladew..... N. Y. City
Chas. A. Schieren..... N. Y. City
Barnett Leather Co..... Little Falls, N. Y.
Booth & Co..... Gloversville, N. Y.
England & Bryan..... Philadelphia, Pa.
*McNeely & Co..... Philadelphia, Pa.
Northrup Glove Mfg. Co..... Johnstown, N. Y.
Rowe, Morris Sum'rhuys Co., Salt Lake City, Utah
C. C. Smoot & Sons Co..... Alexandria, Va.
Winter & Goetz..... Reading, Pa.
Adams Kroehles Sons Co..... Cleveland, Ohio

THEATRES

American Theatre..... N. Y. City
Belasco Theatre..... N. Y. City
Boulevard Theatre..... N. Y. City
Criterion Theatre..... N. Y. City
Keith's Theatre..... N. Y. City
Liberty Theatre..... N. Y. City
Greeley Square Theatre..... N. Y. City
Kramer Theatre..... N. Y. City
Nemo Theatre..... N. Y. City
New York Hippodrome..... N. Y. City
New York Theatre..... N. Y. City
149th St. Theatre..... N. Y. City
Riverside Theatre..... N. Y. City
West End Theatre..... N. Y. City
Grand Opera House..... Chicago, Ill.
North End Theatre..... Asbury Park, N. J.
Keith's Theatre..... Philadelphia, Pa.
Gordon Theatre..... Rochester, N. Y.
Victoria Theatre..... Rochester, N. Y.

TOBACCO

American Cigar Co..... N. Y. City
American Tobacco Co..... N. Y. City
Benito Revero Co..... N. Y. City
Continental Tobacco Co..... N. Y. City

WOOLEN MILLS

Des Moines Hosiery Co..... Des Moines, Iowa
Henderson Woolen Mills..... Henderson, Ky.
Mohawk Valley Cap Factory..... Utica, N. Y.
*Oneida Knitting Mills..... Utica, N. Y.
Oxford Knitting Mills..... Barnesville, Ga.
Suloway Mills..... Franklin Mills, N. H.
*Utica Knitting Mills..... N. Y. City
Everett Mills..... Lawrence, Mass.
Gera Mills..... Passaic, N. J.
Waterloo Woolen Mfg. Co..... Waterloo, N. Y.

MISCELLANEOUS

Chesebrough Mfg. Co..... N. Y. City
Consolidated Gas Co..... N. Y. City
Diamond Match Co..... N. Y. City
Dohler Die Casting Co..... N. Y. City
Faber Pencil Co..... N. Y. City
*Fleischmann & Co., Yeast..... N. Y. City
Fruit Auction Co..... N. Y. City
Imperial Metal Mfg. Co..... N. Y. City
New York Bottling Co..... N. Y. City
New York Ice Co..... N. Y. City
Peerless Blueprint Co..... N. Y. City
*E. G. Soltmann, Blue Prints..... N. Y. City
Spirella Corset Co..... N. Y. City
L. Strauss & Son, Cut Glass..... N. Y. City
Western Union Telegraph Co..... N. Y. City
Zeregas & Sons..... Chicago and N. Y. City
Montgomery, Ward & Co..... Brooklyn, N. Y.
C. J. Tagliabue..... Brooklyn, N. Y.
Thompson Meter Co..... Brooklyn, N. Y.
Tin Plate Decorating Co..... Brooklyn, N. Y.
Jos. Wild..... Brooklyn, N. Y.
Northern Union Gas Co..... Bronx, N. Y.
Arlington Mfg. Co., Celluloid..... Arlington, N. J.
Arrow Lakes Lumber Co..... Arrowhead, B. C.
Belleville Copper Rolling Mills..... Belleville, N. J.
*A. G. Spalding & Bros..... Chicopee, Mass.
Newton Coal & Iron Co..... Denison, Ohio
Votey Organ Co..... Garwoods, N. Y.
*Gen. Elec. Co. Lamp Wks., 73 fans..... Harrison, N. J.
Hudson Condensed Milk Co..... Herman, N. Y.
*R. B. Davis Co., Baking Powder..... Hoboken, N. J.
*National Conduit & Cable Co..... Hudson, N. Y.
Remington Arms & Ammunition Co..... Illon, N. Y.
Baker Castor Oil Co..... Jersey City, N. J.
*Ford Motor Co..... L. I. City, N. Y.
Nat. Sugar Refining Co..... L. I. City, N. Y.
N. Y. Asbestos Mfg. Co..... L. I. City, N. Y.
Borden's Cond. Milk Co..... Middletown, N. Y.
American Hair Felt Co..... Newark, N. J.
Sprock Plush Co..... Newburgh, N. Y.
Bradley Smith Co..... New Haven, Conn.
Geometric Tool Co..... New Haven, Conn.
Germania Art. Weav. Co..... Pompton Falls, N. J.
Dutchess Specialty Co..... Poughkeepsie, N. Y.
Price Fireproofing Co..... Poughkeepsie, N. Y.
Estate of Richard Hamilton..... Rahway, N. J.
Reading Hardware Co..... Reading, Pa.
*Eastman Kodak Co..... Rochester, N. Y.
Haloid Co..... Rochester, N. Y.
North Presbyterian Church..... Rochester, N. Y.
*Rochester Motors Co..... Rochester, N. Y.
Sherwood Shoe Co..... Rochester, N. Y.
G. W. Todd & Co..... Rochester, N. Y.
Yawman & Erbe..... Rochester, N. Y.
*J. A. Roebing..... Trenton, N. J.
Carter Bell Mfg. Co..... Springfield, N. J.
Union Sand & Material Co..... Sugar Creek, Mo.
Cluett, Peabody & Co., Shirt Factory..... Troy, N. Y.
Tim & Co..... Troy, N. Y.
Weehawken, N. J.
Palm, Fechteler & Co..... White Plains, N. Y.
Tod Market..... Wilkesbarre, Pa.
*Hazard Mfg. Co., Wire Rope..... Winslow, Mass.
*Berwick & Smith..... Worcester, Pa.
Spencer Wire Co.....

*Indicates from 6 to 30 fans.



EASTMAN KODAK CO., Rochester, N. Y.—Kodak park plant. One of the largest industrial plants in the world. This concern has long been a user of WING "DISC FANS."

Other Products of the
L. J. Wing Mfg. Co.

FEED-WATER REGULATORS

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POSITIVE PRESSURE BLOWERS

Bulletin No. 10

DAMPER REGULATORS

Bulletin No. 11

TURBINE BLOWERS

Bulletin No. 17

